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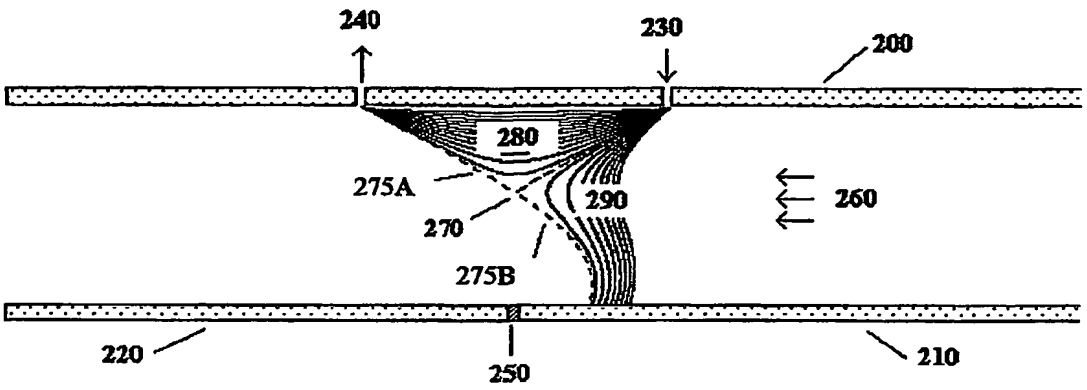
(54) Title: ION MOBILITY SEPARATION DEVICES



(57) Abstract: The invention describes a system and a method to separate ions (and charged particles) suspended in gas based on their ion electrical mobility. Most common ion mobility analyzers involve two parallel plate (or concentric cylinder) elements (electrodes) (200 and 210 in Fig. 2) between which is imposed an electrical field perpendicular to a sheath gas flow field between the cylinders. Separation occurs because high mobility ions tend to follow the electric field while low mobility ions tend to follow the flow field (260 and 280 in Fig. 2). This invention describes various configurations of electrical elements and sheath gas flow fields for ion mobility separation devices with unique performance characteristics. These characteristics include devices in which: the ion inlet and outlet (630 and 625 in Fig. 6A) are on the same element; the inlet and outlet are at the same voltage; the outlet is upstream from the inlet; the outlet is on the axis; the inlet is on the axis; and the ions are focused on the outlet.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
IPC(7) : H01J 49/04
US CL : 250/288
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 250/288,282,281,287,292

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EAST

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,936,242A (De La Mora et al) 10 August 1999 (10.08.1999. See entire document.	1-38
A	US 6,124,592 A (Spangler et al) 26 September 2000 (26.09.2000), see entire document.	1-38

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